

SPATIAL DISTRIBUTION OF THE EMERGING CONTAMINANT TRICLOSAN IN SEDIMENTS AND WATER OF AN URBANIZED ESTUARY: GREENWICH BAY, RHODE ISLAND, USA. David Katz (katz.david@epa.gov), Mark G. Cantwell, Julia Sullivan, Monique M. Perron, Robert M. Burgess, Kay T. Ho, & Michael A. Charpentier. Atlantic Ecology Division, USEPA, 27 Tarzwell Drive, Narragansett, RI.

Increase in the use of personal care products (PCPs) has resulted in the release and accumulation of a diverse assemblage of emerging chemicals in the environment. One such chemical, triclosan (TCS), an antimicrobial compound, has been incorporated into many PCPs for approximately 40 years and as a result, is present in wastewater treatment plant (WWTP) effluents. Along the coastline of the United States, many wastewater outfalls discharge directly or indirectly into the marine environment. Continuous discharge of wastewater effluent has resulted in the accumulation of PCP components such as TCS in coastal and estuarine sediments. This study investigated the factors controlling the accumulation and spatial distribution of TCS within the sediments of a small urbanized embayment with a single domestic WWTP. Dissolved TCS in the water column was found to range between 0.5 and 7.4 ng L⁻¹ with higher concentrations further from the WWTP outfall. Sediment TCS was measured at sites throughout the bay with higher concentrations found in the coves where sediments were enriched in organic carbon. A bay-wide sediment TCS budget was determined by spatial interpolation. Annual accumulation rates exceeded the calculated annual discharge of TCS from the local WWTP, indicating contribution of TCS from previously unidentified source(s). Further investigation using sediment cores and a chemical tracer revealed that advective processes are likely responsible for transporting the excess TCS into the embayment. Results suggest a significant fraction of the TCS in Greenwich Bay originate from upper Narragansett Bay, which receives effluent from several large WWTPs and contains TCS-contaminated sediments from past manufacturing activities. This study demonstrates an approach for better understanding the factors affecting the distribution of an emerging contaminant in estuarine systems.